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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/716,250	11/17/2003	Hai Deng	42P17681	6528

7590 08/10/2006

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EXAMINER	
NGUYEN, DAO H	

ART UNIT	PAPER NUMBER
2818	

DATE MAILED: 08/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/716,250	DENG ET AL.	
	Examiner	Art Unit	
	Dao H. Nguyen	2818	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 June 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *02 June 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. In response to the communications dated 04/27/2006 through 06/02/2006, claims 1-24 are active in this application.

Claim(s) 25-29 have been cancelled (see page 8 of the Amendment filed 12/27/2005).

Applicant is reminded that cancelled claims must be provided with proper status identifier.

Remarks

2. Applicant's remarks, filed 06/02/2006, have been fully considered, but are not persuasive. The applied reference has a common Assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that, at the time of the invention was made, any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131. See further MPEP section 706.02(b).

This rejection may not be overcome by the filing of a terminal disclaimer. See *In re Bartfeld*, 925 F.2d 1450, 17 USPQ2d 1885 (Fed. Cir. 1991). In addition, Terminal

Disclaimer filed 04/27/2006 and re-submitted on 06/02/2006 have been considered but have not been approved because the signed Attorney is not of record.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless --
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claim(s) 1-7, 9-21, and 23-24 is/are rejected under 35 U. S. C. § 102 (e) as being anticipated by U.S. Patent Application Publication No. 2005/0236714 by Leu et al.

The applied reference has a common Assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131. See MPEP section 706.02(b).

Regarding claim 1, Leu discloses a method comprising: depositing a zeolite-solvent solution 102 on an underlying layer 100 (see paragraphs [0010], [0027]);

removing at least some of the solvent from the zeolite-solvent solution to form a zeolite film (see paragraphs [0010], [0027]); and

depositing a carbon doped oxide (CDO) 122 (paragraph [0023] in the zeolite film to form a zeolite-CDO composite film (see also paragraphs [0009]-[0016]);

etching a via opening 118 and a trench opening 116 in CDO-zeolite composite film;

forming a conductive material 104/107 in the via opening and the trench opening. See figs. 1-2, and paragraphs [0008-0027].

Regarding claim 2, Leu discloses the method wherein the solvent is water. See paragraphs [0013-0016].

Regarding claim 3, Leu discloses the method wherein the solvent is an organic oligomer. See paragraph [0015].

Regarding claim 4, Leu discloses the method wherein the organic oligomer is selected from a group consisting of polyethylene glycol, poly styrene, poly (Methacrylates), Poly (acrylate), or poly ethylene oxide. See paragraphs [0012-0016].

Regarding claim 5, Leu discloses the method wherein removing at least some of the solvent from the zeolite-solvent solution comprises: drying the zeolite-solvent solution. See paragraph [0016].

Regarding claim 6, Leu discloses the method wherein removing at least some of the solvent from the zeolite-solvent solution comprises: vacuuming the zeolite-solvent solution. See paragraph [0016].

Regarding claim 7, Leu discloses the method wherein depositing the zeolite-solvent solution on the underlying layer comprises: spin-coating the zeolite-solvent solution on the underlying layer. See paragraph [0016].

Regarding claim 9, Leu discloses the method wherein depositing the CDO in the zeolite film comprises chemical vapor deposition of the CDO in the zeolite film. See paragraph [0023].

Regarding claim 10, Leu discloses the method wherein the CDO 122 is a silicon oxide. See paragraph [0023].

Regarding claim 11, Leu discloses the method wherein the underlying layer 100 is a wafer. See paragraph [0016].

Regarding claim 12, Leu discloses the method wherein the underlying layer is an interlayer dielectric layer. See figs. 2.

Regarding claim 13, Leu discloses the method wherein the interlayer dielectric layer comprises a zeolite-carbon doped oxide composite film. See figs. 2, and paragraphs [0024-0028].

Regarding claim 14, Leu discloses the method further comprising calcinating the zeolite-CDO composite film to form a solid phase zeolite-CDO composite film. See paragraphs [0008-0027].

Regarding claims 15-18, Leu discloses the method comprising all claimed limitations. See paragraphs [0008-0027].

Regarding claim 19, Leu discloses a method comprising

forming a zeolite-carbon doped oxide (CDO) composite interlayer dielectric 102/122 on an underlying layer 100;

etching a via opening 118 and a trench 116 in the zeolite-CDO composite interlayer dielectric; and

forming a conductive material 104/107 in the via opening and the trench. See figs. 1-2, and paragraphs [0008-0027].

Regarding claim 20, Leu discloses the method wherein forming the zeolite-CDO composite interlayer dielectric on the underlying layer comprises:

depositing a zeolite-solvent solution 102 on the underlying layer 100;

drying the zeolite-solvent solution to remove at least some of the solvent to form a zeolite film (paragraph [0027]); and

depositing a CDO 122 in the zeolite film by chemical vapor deposition to form a zeolite-CDO composite film (paragraph [0023];

heating the zeolite-CDO composite film; and cooling the zeolite-CDO composite film (paragraphs [0012-0014]).

Regarding claim 21, Leu discloses the method wherein depositing the zeolite-solvent solution on the underlying layer comprises spin-coating the zeolite-solvent solution on the underlying layer. See paragraph [0027].

Regarding claims 23 and 24, Leu discloses the method comprising all claimed limitations.

Claim Rejections - 35 U.S.C. § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to

a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claim(s) 8 and 22 is/are rejected under 35 U.S.C. 103 (a) as being unpatentable over Leu et al. (U.S. Patent Application Publication No. 2005/0236714)

Regarding claims 8 and 22, Leu discloses the method comprising all claimed limitations, except for teaching that depositing the zeolite-solvent solution on the underlying layer comprises dip-coating the zeolite-solvent solution on the underlying layer.

However, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the invention of Leu so that the zeolite-solvent solution being deposited on the underlying layer by a dip-coating method, because such method is well known in the art, and that those skilled in the art will recognize that such modification and variations can be made without departing from the spirit of the invention of Leu, and that it would involve only routine skills in the art.

Conclusion

7. **THIS ACTION IS MADE FINAL.** A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date

the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dao Nguyen whose telephone number is (571)272-1791. The examiner can normally be reached on Monday-Friday 9:00am - 6:00pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Smith, can be reached on (571)272-1907. The fax numbers for all communication(s) is (571)273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571)272-1625.

Dao H. Nguyen
Art Unit 2818
August 2, 2006

DOUGLAS W. OWENS
PRIMARY EXAMINER

Accepted
DN
08/02/06

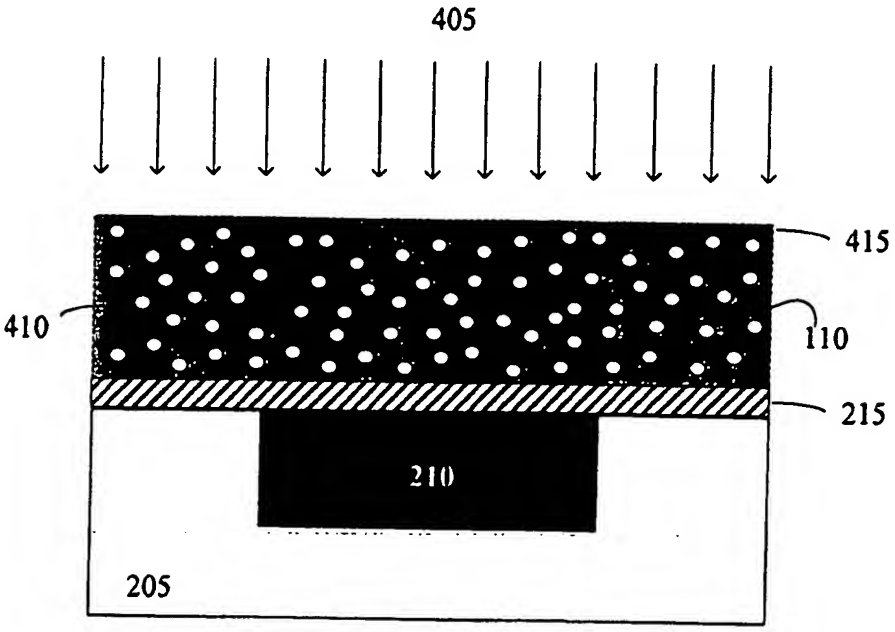

FIG. 4

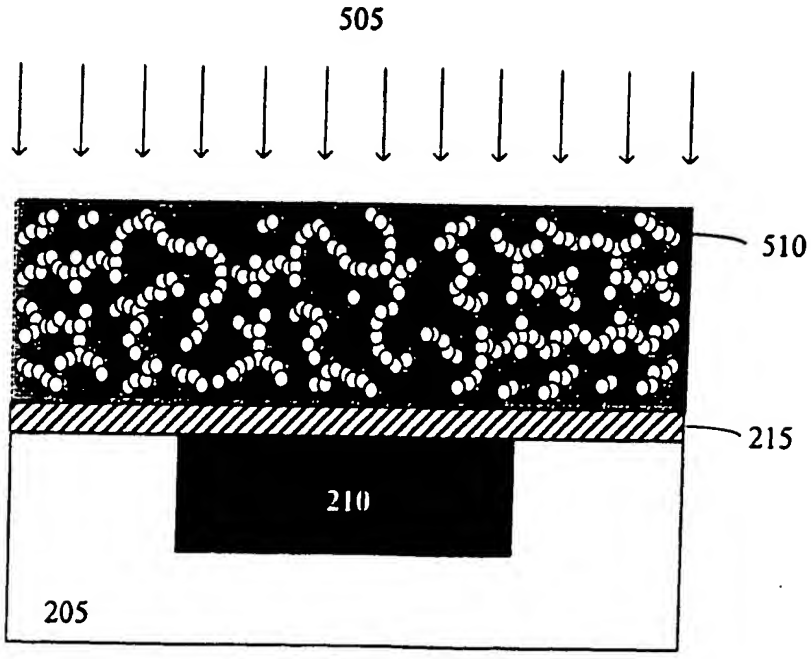

FIG. 5

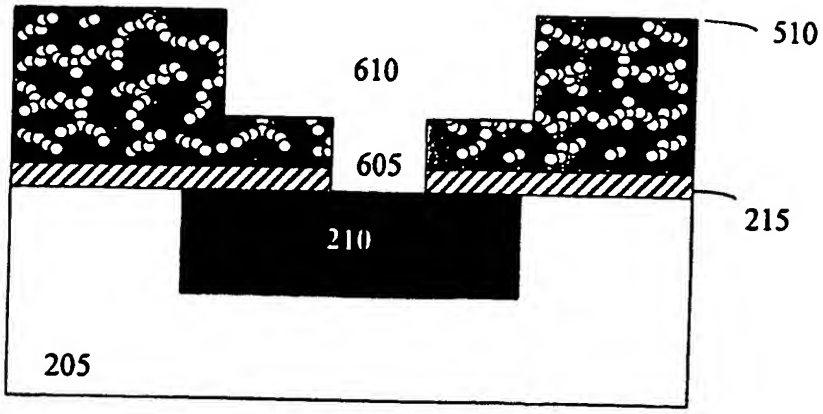

FIG. 6

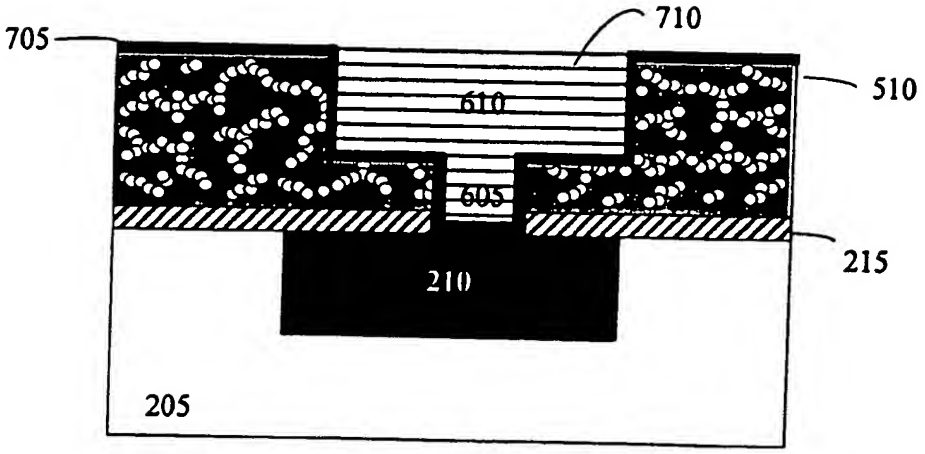

FIG. 7